being untouched. This work was accomplished by eleven Jesuit fathers, assisted by four converts. In 1564 the Daimio of Ōmura, the first Christian Daimio, known as Sumitada, or Ōmura Risen (Risen was his Buddhist name), was baptised, and adhered to the faith until his death in 1587. It is of this convert that Crasset writes :—

"He went to the chase of the bonzes as to that of wild beasts, and made it his singular pleasure to exterminate them from his states" ("Murdoch," p. 238).

It would, however, be merely special pleading to take this language literally, otherwise than as expressing the worthy father's admiration of the vigour with which the newly made convert promulgated Christianity within his petty domain. Up to 1570, out of the fifteen or sixteen millions of Japanese, some twenty thousand had been baptised. This seems a small proportion, but the true measure would be the ratio of the baptised to the population of those parts of Japan where the gospel had been, with some adequacy, preached. As to the quality of their Christianity it is difficult to form a judgment. The steadfastness of large numbers under persecution is some guarantee of the reality of their belief; on the other hand many in becoming Christians followed the example or obeyed the commands of their feudal superiors.

Another much debated point, not easy to determine, is to what extent the native converts "provoked" the immense majority who still adhered to the Way of the Gods and the Way of Buddha. It is certain that the Buddhists were "provoked," but there is little evidence that they had any real cause of complaint during the period now considered—the provocation was of a passive, not of an aggressive character. On the whole, the fathers were far from unpopular with the common folk. They were looked upon as superior beings, and Froez says of his reception at Yokoseura :—

"All the Christian inhabitants came to meet us and were so delighted at our arrival that they would willingly have taken us on their shoulders and borne us off."

It was not until 1587 that persecution began, the result of a fit of policy of the cruel, crafty, but capable Taiko, Hideyoshi.

Dr. Haas writes lucidly, and his pages are full of interesting details; but the narrative is obscured by an over-abundance of matter that might well be relegated to notes or appendices. The Germans seem unable to distinguish between books and note-books.

F. VICTOR DICKINS.

OUR BOOK SHELF.

Lectures on the Diseases of Children. By Robert Hutchison, M.D., F.R.C.P. (London: Edward Arnold.) Price 8*s.* 6*d.* net.

IT is difficult to praise this little volume too highly. It deals with one of the most attractive and satisfactory subjects in medicine, the treatment of children's diseases; the style is excellent, and the illustrations, which, with one or two exceptions, are taken from photographs of the author's cases, are unusually good.

In some three hundred pages Dr. Hutchison describes aspects of some of the more common diseases of childhood which, as he says, "are not usually dealt with in systematic lectures." In the first instance, the lectures were given at the London Hospital; subsequently they were published serially in the *Clinical Journal,* while their present appearance in book form is in response to the request of a number of readers who wanted them in a convenient form for reference.

The early chapters deal with the problems of infant feeding, and the subject, which unfortunately is closely allied, of the various digestive disturbances which occur in hand-fed babies. Upon questions of diet Dr. Hutchison speaks with special authority, and his remarks on the difficult subject of artificial feeding are concise and practical.

In the space of a short lecture it is not possible or desirable to deal with all the conceivable methods by which children might be, or have been, fed, but it seems an omission not to mention "laboratory" milk, which, whatever its objections, certainly offers the physician a method of wonderful precision in prescribing the exact percentage of fat, proteid, and lactose which he requires for any individual patient. The establishment in London of the Walker Gordon Laboratory, at which this milk can be obtained, and the existence of a farm in connection with it at which every precaution is taken to procure germ-free milk with scientific accuracy, certainly deserve mention in any book which deals with the subject of substitute feeding. The expense of "laboratory" milk puts it beyond the reach of many babies, but it is less expensive than a wet nurse, and avoids all the disadvantages inseparable from employing one.

In succeeding chapters Dr. Hutchison deals with various common diseases of childhood. They are all delightful reading, full of common sense and helpful suggestion as to diagnosis and treatment. One would like to quote extensively, but the book is one that every student of the subject, whether he be qualified or not, should possess.

Special interest attaches to the lecture on mental deficiency in childhood, often a subject of great difficulty in practice, and one with which the ordinary text-book scarcely deals. The photographs illustrating this chapter are particularly good.

The concluding chapters are devoted to the diagnostic significance of some common symptoms, such as wasting, cough, fever, &c. It is impossible to do full justice to this delightful book in a short notice. The work forms a valuable adjunct to the good text-books already written on the subject, and it shows to the full the clinical knowledge and the literary ability of the author, whose reputation, already high, will no doubt be increased by it.

Elementary Manual for the Chemical Laboratory. By Louis Warner Riggs, Ph.D., Instructor in Chemistry in Cornell University. Pp. vi+138. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1904.) Price 5*s.* 6*d.* net.

THIS volume embodies the author's idea of what should be taught during a one-year course of chemistry, the time available being not less than a hundred and twenty hours for laboratory practice, and sixty for "recitation" work. It is arranged in short numbered paragraphs, each containing a direction to the student or an explanation of some point or process, and is intended to be used, under the guidance of an instructor, in conjunction with some general text-book of chemistry and physics.

About one-third of the work is devoted to preliminary experiments in general chemistry. The student is then introduced to simple volumetric analysis, the principles of which are very well explained

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—this forming, perhaps, the best portion of the book. After three experiments in gravimetric work the learner passes on to systematic qualitative analysis, treated from the standpoint of electrolytic dissociation. The author recognises that, "logically," the quantitative work should follow rather than precede the qualitative; but after repeated trials he prefers the order indicated. In the present connection, however, the matter is more one of convenience than of logic.

Accepting the author's system, the experiments themselves are judiciously selected, and well fitted for their purpose. But there are educationists who would by no means agree that "theoretical explanations should be reserved for the recitation-room," and not given in the laboratory. Still less would they say that the students should "study thoroughly all the details of an experiment before attempting to perform it," and that "this should be done outside the laboratory." Whether such a system would tend to produce a hodman or an architect would depend, as it seems to the writer, less upon its own merits than upon the personality of the instructor. C. S.

Die Einheit der Naturkrafte in der Thermodynamik. By Richard Wegner. Pp. viii+132. (Leipzig: Von Veit and Co., 1904.)

As described in the secondary title, this pamphlet is an attempt to deduce from the kinetic energy of non-elastic atoms, corporeal and ethereal, all known physical forces, chemical, electrical, and mechanical, including gravity. Nothing Boschovichian is assumed; only the kinetic energy of moving atoms of different sizes. It is not easy to follow an argument which provisionally assumes that the atoms are held together to form molecules with regular vibration frequencies capable of propagating through the surrounding swarm of ether-atoms waves of condensation and rarefaction, by means of the reactions and interference of which (when there are two or more molecules) attractions are brought into being; and which then, in terms of this general outlook, gives reasons why the reaction of the ether atoms may be found sufficient to hold the corporeal atoms together. A necessary consequence of the investigation is that gravity is propagated in time, and should be a function of the temperature. The author has tested the latter point by experiment, and finds some evidence in favour of its truth. The source of the chemical elements is found in the different magnitudes of the atoms, with the corresponding differences in their energetic combinations. The temperature of a body is proportional to the mean molecular weight, multiplied by the square of the mean translational velocity of the molecule; divided by the relative number of molecules in unit volume; multiplied by the relative mean path of the molecule. Since, according to the theory elaborated, the kinetic energy of the elementary particles implies attraction, all bodies will be surrounded by a layer of condensed gas and ether particles. In the waves in the ether sheath is found the source of the electrical current. Electrostatic action, on the other hand, depends on chemical actions in the ether sheath. The applications to chemical and electrical phenomena are admittedly crude and imperfectly worked out; but the author claims to have proved the possibility of deducing all the recognised forces of nature from the kinetic energy of non-elastic Lucretian atoms.

The Science and Practice of Photography. By Chapman Jones, F.I.C., &c. Fourth edition. Pp. 569. (London: Iliffe and Co., Ltd., 1904.) Price 5*s.* net.

THIS volume, which is the fourth edition of the work, has been very greatly enlarged and rewritten since the appearance of the third edition, the number of chapters having been increased from fifty-five to sixty-eight. It may be considered as forming a most excellent guide to the practice of photography, and a perfect reference for those who so continually question one as to "the best book on photography, for a beginner, you know"; and it will doubtless prove useful as a reference book to many who have long passed the beginner stage. There is a decision of tone and clearness of exposition, combined with an intelligent anticipation of the many questions which arise at every step of the path, which render it especially suitable for this purpose.

At the same time, the scientific reader who hopes to gain from it some account of the work which has been done of late years, with a view to the clearing up in some measure of the chemical and physical problems in which photography abounds, will probably be greatly disappointed. The two most noteworthy features of this, as of almost all English works on photographic science, are found in the method in which contemporary German literature is ignored, and in which the whole of modern physical chemistry is disregarded. The fact, for instance, that development may be regarded as a reversible heterogeneous reaction occurring between ionised salts, in accordance with the mass law, seems to be entirely beyond the idea of this or any other book on the subject. Development with ferrous oxalate is here represented by the equation:—

$$3AgBr + 3FeC_2O_4 = FeBr_3 + Fe_2(C_2O_4)_3 + 3Ag,$$

which, involving as it does the existence of ferric ions in the developer after use, gives a sufficiently distorted view of the reaction. While we find the chemical theory of the book to be of this type, the information as to the progress of sensitometry is of the slightest, no mention whatever being made of the notable researches by Dr. Eder. A most original suggestion as to the nature of the developable condition is to be found at the close of the chapter devoted to that subject. In brief, this book is a most delightful manual of the practice of photography, but can scarcely claim to represent the scientific side of the subject in any sense whatever. C. E. KENNETH MEES.

Ants and Some Other Insects. An Inquiry into the Psychic Powers of these Animals. With an Appendix on the Peculiarities of their Olfactory Sense. By Dr. August Forel. Translated from the German by Prof. William Morton Wheeler. Pp. 49; figures. (Chicago, 1904.) Price 2*s.* 6*d.*

AN elaborate treatise on the senses of insects, especially ants, illustrated by numerous experiments. The book deserves the most serious attention of students of psychology and animal intelligence; but it would occupy too much space, nor would any useful object be gained, by attempting to epitomise either the body of the work or even the author's deductions. We may, however, quote the following conclusions:—

"Even to-day I am compelled to uphold the seventh thesis which I established in 1877 in my habilitation as *privat-docent* in the University of Munich:

"'All the properties of the human mind may be derived from the properties of the animal mind.'

"I would merely add to this:

"And all the mental attributes of higher animals may be derived from those of lower animals. In other words, the doctrine of evolution is quite as valid in the province of psychology as it is in all the other provinces of organic life. Notwithstanding all the differences presented by animal organisms and the conditions of their existence, the psychic functions of the nerve-elements seem nevertheless everywhere to be in accord with certain fundamental laws, even in the cases where this would be least expected on account of the magnitude of the differences."

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